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ABSTRACT

A study examined the treatment of sole community hospitals under the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA) and the Prospective Payment System (PPS) for Medicare as compared to the treatment of hospitals not designated as sole community hospitals under these same two policy guidelines. (A sole community hospital is defined as a hospital constituting the primary, and often only, source of inpatient services for residents of a market area.) The data analyzed in the study were obtained from several sources, including the Hospital Cost and Utilization Project database of the National Center for Health Services Research and Health Care Technology Assessment, the Health Care Financing Administration, and individual hospitals' Medicare Cost Reports. These data indicated that sole community hospitals are primarily small, rural, and western. Organized chiefly on a not-for-profit basis, they play virtually no role in medical education. In comparison with national averages, they have fewer specialized services and facilities. Their financial position appears to be somewhat less favorable than that of comparable facilities, and they tend to have older facilities and to have less access to capital markets. These facts, coupled with further analysis, may indicate the need for even more direct remedial action than those provided for sole community hospitals in TEFRA and PPS. (This report includes 12 tables.) (MN)

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Sole Community Hospitals: Are They Different?

Hospital Studjes Program
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5

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Background

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Additional information on the Hospital Studies Program and the Hospital Cost and Utilization Project is available from the National Center for Health Services Research and Health Care Technology Assessment, 3-50 Park Building, Rockville, MD 20857; 301-443-5706.

Copies of the Hospital Studies Program publications are available from the NCHSR&HCTA Publications and Information Branch, 1-46 Park Building, Rockville, MD 20857; 301-443-4100.

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HCUP Research Notes are derived from research conducted by members of the Hospital Cost and Utilization Project (HCUP), a component of the Hospital Studies Program, Division of Intramural Research, National Center for Health Services Research and Health Care Technology Assessment. This series provides information from HCUP research to administrators, policymakers, health care professionals, and researchers on important issues related to hospitals.

Overview

Goals of the Hospital Study Program are to help understand how hospitals provide health care services and to determine patterns of hospital use and costs. HCUP is specifically designed to use national data to provide information and analyses on research and policy questions pertaining to the performance of the hospital industry. Issues already addressed or to be addressed in forthcoming studies include:

- How does competition among hospitals influence costs, case mix, length of stay, and surgical rates?
- Why do length of stay and use of ancillary services vary across hospitals and over time, both overall and for specific diseases?
- Why do rates of specific surgical procedures, such as cesarean sections and coronary artery bypass, vary across hospitals?
- Do hospitals shift unreimbursed costs of patients covered by Medicare and Medicaid to patients covered by private insurance?
- Do procedures, services and diagnoses vary across specific groups of patients?
- To what degree does medical staff specialization affect the mix and length of stay of hospital patients?
- Do larger hospitals treat different types of patients and have lower costs per patient for specific diagnoses than smaller hospitals?

Data base

Nearly 400 of the more than 5,500 short-term, general, non-Federal hospitals in the United States are included in the Hospital Cost and Utilization Project. These hospitals were selected according to scientific sampling procedures to represent the range of factors influencing hospital behavior, utilization, and costs. Participation in the study was voluntary, but hospitals with incomplete discharge abstract data files, in terms either of information or period of coverage, were not included in the sample.

Data were acquired from a number of published and unpublished sources. Information on patient clinical status and use of inpatient services was obtained from hospital discharge abstracts provided by 12 major discharge abstract services. Patient data cover more than 20 million discharges from 1970 through 1977 for national sample hospitals. Information on characteristics of each hospital was obtained from the American Hospital Association's Annual Survey of Hospitals, various Special Surveys conducted by the American Hospital Association, and each hospital's annual Medicare Cost Report. Data on medical staff characteristics of a subsample of hospitals were obtained from the American Medical Association's Masterfile of U.S. Physicians. Characteristics of the community in which each hospital is located were obtained from the Area Resource File, compiled by the Bureau of Health Professions, Health Resources and Services Administration, U.S. Department of Health and Human Services.

The HCUP data files represent a unique linkage of hospital, patient, physician, and community information for a large sample of hospitals from 1970 to 1977. They permit comprehensive assessment of factors affecting patterns of hospital use and costs.

Data files for HCUP were constructed under the technical direction of NCHSR by SysteMetrics, Inc., of Santa Barbara, California (funded by contract OASH 233-78-3001), and by Mandex, Inc., of Vienna, Virginia (funded by contract OASH 233-81-3030).

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Sole Community Hospitals: Are They Different? A Statistical Analysis of the Hospitals and Their Treatment Under TEFRA and PPS

Dean E. Farley

During the last 15 years, public officials have adopted a variety of policies to restrain rapidly rising hospital costs. However, it is difficult to design comprehensive policies that are also sensitive to the problems of individual institutions. For this reason, most cost-containment programs provide exceptions and adjustments for hospitals with unusual characteristics.

Sole community hospitals (SCHs) are one class of institutions identified by the Congress and the Health Care Financing Administration (HCFA) for special treatment under the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA) and the Social Security Amendments of 1983, which authorized a Prospective Payment System (PPS) for Medicare. In principle, an SCH constitutes the primary, and often the only, source of inpatient services for the residents of a market area. To qualify for treatment as an SCH under TEFRA and PPS, a hospital must apply to HCFA and demonstrate its eligibility under existing regulations. The standards for this designation pertain to the distance of the hospital from neighboring facilities, the portion of patients in its service area receiving treatment at other hospitals and a requirement that the hospital be located in a rural (non-Metropolitan Statistical Area) area.[1] Once the application is approved, a hospital becomes exempt from TEFRA limitations on reimbursable costs, is reimbursed under PPS according to a formula that gives greater weight to hospital-specific cost factors, and becomes eligible for special payments in the event of a significant decrease in volume.

Sole community hospitals have never been analyzed in detail although HCFA is now preparing such an analysis for a forthcoming report to Congress. This Research Note assembles information on SCHs collected by the National Center for Health Services Research and Health Care Technology Assessment and examines the extent to which SCHs appear to warrant special consideration for Medicare reimbursement. This Research Note also analyzes patterns of SCH designation and the potential size of the program, complementing work now under way at HCFA.

Analytical Issues

Table 1 summarizes the distribution of sole community hospitals by size and regional location. These hospitals are small; more than half have less than 50 beds and nearly 85 percent have fewer than 100 beds. Western states contain 65 percent of all SCHs whereas only 6 percent are in the Northeast. This distribution undoubtedly reflects regional differences in population density. Nearly all SCHs are located in rural areas. A small number are in counties designated as part of a metropolitan area but nearly all of these are in sparsely settled sections of urban counties with large areas.[2]

The concern of Congress and HCFA regarding sole community hospitals stems from their role as the dominant source of inpatient services in their service areas. If PPS and TEFRA adversely affect the ability of these facilities to deliver medical care, the access of

[1] The background note summarizes the legislative and regulatory history of sole community hospitals and describes the detailed criteria used to designate these hospitals.

[2] The location of sole community hospitals in urban counties is the result of eligibility criteria used prior to October 1, 1983. Hospitals can be extremely isolated and still be part of an official metropolitan area. If HCFA continues to treat sole community hospitals in a special manner, it may wish to reconsider its requirement that they be located in rural counties. Potentially, HCFA's policy denies SCH status to hospitals that are indeed the object of legislative concern.

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Table 1. Number of sole community hospitals (SCHs) by region and bed size, and SCHs as a percent of similar hospitals and of all SCHs (United States, November 29, 1982).

	0-49 beds	50-99 beds	100-199 beds	200-299 beds	300 + beds	All
Northeast	2	12	3	—	—	17
As percent of similar hospitals	5.0	8.5	1.6	—	—	2.1
As percent of all SCHs	0.8	4.5	1.1	—	—	6.4
North Central	22	11	6	2	1	42
As percent of similar hospitals	5.8	2.5	1.6	1.1	0.9	2.5
As percent of all SCHs	8.3	4.2	2.3	0.8	0.4	15.8
South	17	8	7	—	2	34
As percent of similar hospitals	3.5	1.4	1.3	—	1.6	1.6
As percent of all SCHs	6.4	3.0	2.6	—	0.8	12.8
West	106	47	16	3	—	172
As percent of similar hospitals	33.7	30.5	6.8	2.4	—	16.2
As percent of all SCHs	40.0	17.7	6.0	1.1	—	65.0
All	147	78	32	5	3	265
As percent of similar hospitals	12.1	5.6	2.4	0.7	0.7	4.7
As percent of all SCHs	55.5	29.4	12.1	1.9	1.1	100

Note: "Similar hospitals" refers to non-Federal community hospitals in the indicated region and size category.
Source: National Center for Health Services Research and Health Care Technology Assessment, Hospital Studies Program. Based on data provided by the American Hospital Association and the Health Care Financing Administration.

[3] For a more detailed discussion of reservation quality, see Joskow (1980).

[4] Friedman and Pauly (1983) report that the average costs of hospital care decline with volume, especially in the short run. Flood, *et al.* (1984), find that surgical outcomes improve with volume for specific procedures and diagnoses.

entire communities to hospital services would be compromised. Congress and HCFA have attempted to moderate the potential effects of these programs on SCHs until their implications are carefully evaluated. This caution is made easier at the Federal level by the fact that SCHs represent less than 5 percent of all hospitals and a smaller portion of beds. Consequently, special SCH provisions protect limited and well-defined populations without significantly undermining the basic programmatic objectives of TEFRA and PPS.

Several theoretical arguments can be advanced to justify the special treatment of sole community hospitals under TEFRA and PPS. One is that their average costs are likely to be higher than for comparable hospitals in other locations. In comparison to hospitals operating in more competitive markets, it is more difficult for a sole community hospital to refer patients elsewhere when it is full. It probably will maintain an unusually high level of excess capacity, or "reservation quality," to avoid this problem, lowering its occupancy rate and increasing the fixed costs of its operation.[3] Indeed, the problem of referring patients to other facilities may influence more than occupancy rates. *A priori*, one would expect sole community hospitals to maintain more facilities and to treat a broader range of diagnoses than otherwise similar hospitals. Because of their small average size, it is doubtful that SCHs can provide a wide range of facilities and services efficiently.[4]

The size, isolation, and location of SCHs may also indicate the need for special SCH provisions in the Medicare program. SCHs may be chronically understaffed or have unusually high labor expenses because of difficulties in hiring skilled personnel. They may

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be located in areas with shortages of particular medical specialists. Their target populations may present peculiar sets of medical problems. Medical decisions, especially those regarding hospitalization and length of stay, may be affected by the need to provide services to geographically dispersed patients. These hospitals may also have trouble in gaining access to financial markets, making it difficult to undertake large capital projects in a timely manner.

Table 1 suggests that sole community hospitals are not representative of hospitals in general and that their problems may be similar to those of other small rural institutions. Consequently, their treatment under Medicare raises two issues. One is the extent to which differences with nationally representative hospitals indicate the need for special reimbursement provisions. The second issue is whether SCHs are the appropriate class of facilities at which to target such provisions, *i.e.*, whether the nature or severity of their problems can be distinguished from those of other small rural institutions.

The analysis presented below addresses both of these issues. It first compares characteristics of SCHs with other non-Federal community hospitals participating in the American Hospital Association 1982 Annual Survey in a straightforward manner. Whenever possible, variables are expressed in terms that control for the size of institutions. These analyses examine whether systematic differences justify differential treatment of SCHs for Medicare reimbursement.

In addition, comparisons are made with an adjusted control group that reflects the unusual size and locational distribution of SCHs. For this purpose, hospitals were stratified according to region, bed size, and urban-rural location. Effects associated with SCH status were estimated using a binary variable in a regression based only on hospitals in cells with at least one SCH hospital. Characteristics reported for the adjusted control group were then computed by adjusting the actual mean SCH value for the estimated effects of SCH status. This analysis addresses the question of whether SCH hospitals are sufficiently distinct from otherwise similar hospitals to warrant excluding the latter from the special SCH provisions of Medicare.[5]

Characteristics of Sole Community Hospitals

Table 2 summarizes the organizational characteristics of sole community hospitals. Relative to national averages, these facilities are less likely to be voluntary (private not-for-profit) institutions and nearly twice as likely to be publicly controlled. Twenty-three percent of them are operated under a management contract, nearly twice the national average. However, comparisons with the adjusted control group indicate that many of these differences can be explained by size and location. The only statistically meaningful differences with respect to control that remain after adjusting for these factors are that sole community hospitals are somewhat more likely to be voluntary hospitals and less likely to be operated on a for-profit basis.

[5] See Sources of data section for a complete discussion of the data and their sources.

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[6] In contrast, the overall length of stay is quite consistent across the three groups. This reflects the presence of more long-term admissions in hospitals with shorter acute-care admissions.

[7] These data are derived from the Hospital Cost and Utilization Project data base. There are 11 hospitals with SCH status in this sample, observed over an 8-year period. The usefulness of these data in discerning significant differences in behavior based upon SCH status is limited, and questions exist about the representativeness of HCUP SCH hospitals. See Sources of Data for a more detailed discussion of these issues.

Table 2. Organizational characteristics of U.S. community hospitals in 1982 by sole community hospital status.

	Sole community hospitals	Other community hospitals	Adjusted control group[a]
Size (average number of beds)			
Total beds	64.0	189.6***	65.5
Short-term beds	54.9	181.3***	57.7
Long-term beds in hospitals with separate units[b]	35.2	61.9***	34.8
Control (percents)			
Private nonprofit	52.2	59.9*	45.7*
For-profit	2.0	11.6***	11.4***
Public	45.8	28.5***	42.9
Contract management	23.1	11.9***	19.4
Owned, leased or sponsored by another corporation	25.1	23.7	24.6
Affiliations and accreditation (percents)			
Medical school affiliation	0.4	14.8***	0.9
Any internship/residency program	0.8	18.8***	0.5
Participation with HMO	2.8	18.7***	9.0**
Accredited by JCAH	57.5	79.5***	58.2

[a]Mean value of other community hospitals, adjusted for size, location and urban-rural status. See text. [b]Statistics apply only to hospitals reporting a separate long-term care unit. *Indicates a statistically significant difference at the .05 level, testing the hypothesis of no difference between the means of sole community and other hospitals, using a two-tailed test. **Indicates a statistically significant difference at the .01 level, using a two-tailed test. ***Indicates a statistically significant difference at the .001 level.

Source: National Center for Health Services Research and Health Care Technology Assessment, Hospital Studies Program. Based on data provided by the American Hospital Association and the Health Care Financing Administration.

Almost no sole community hospitals are affiliated with a medical school or maintain an internship or residency program. Fifty-seven percent of them are accredited by the Joint Commission on Accreditation of Hospitals. All of this is fairly typical of other hospitals with their size and location. Less than 3 percent of sole community hospitals routinely provide services to members of Health Maintenance Organizations (HMOs), significantly less than for either comparison group.

Utilization and case mix. Table 3 summarizes the utilization and case mix of sole community hospitals. Most differences are based on SCH status and can be explained by the size and location of these hospitals. Even when differences persist after controlling for these factors, SCH hospitals display few characteristics that suggest they will be particularly disadvantaged by Medicare's Prospective Payment System.

SCH-designated providers actually have shorter lengths of stay for acute care admissions than other hospitals even after controlling for size and location.[6] One reason for this is suggested by the length-of-stay weighted case-mix index, which measures the expected length of stay in hospitals relative to the national average over time based upon the composition of their admitting diagnoses.[7] This index is smallest for sole community hospitals, indicating that their

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Table 3. Utilization and case-mix characteristics of hospitals by sole community hospital status (1982 AHA data unless otherwise indicated).

Length of stay (average number of days)	Sole community hospitals	Other community hospitals	Adjusted control group[a]
All admissions	8.76	8.42	8.40
Short-term admissions	4.89	6.67***	5.27***
Long-term admissions[b]	480	532	532
Outpatient utilization (visits per short-term admission)			
Outpatient visits	5.20	4.41**	5.57
Emergency visits	2.69	2.18***	2.48
Medicare utilization			
Percent of all admissions	32.42	34.69**	37.21***
Average length of stay (days)	8.38	9.94***	8.60
Medicaid utilization			
Percent of all admissions	8.32	9.54**	9.12
Average length of stay (days)	34.66	16.15*	20.37*
Other utilization			
Gross occupancy rate (percent)			
All beds	54.00	68.14***	56.92**
Short-term beds	47.25	65.88***	52.11***
Standardized occupancy rate[c] (percent)			
All beds	72.63	74.34*	74.39*
Short-term beds	70.06	73.46***	72.53***
Procedures per short-term admission	0.31	0.45***	0.35***
Case mix and use of procedures[d]			
LOS-weighted case-mix index[d]	105.9	109.7**	116.0***
Percent of admissions due to[d]			
Acute myocardial infarction	1.34	1.27	1.52
Normal delivery	6.91	5.30***	6.13*
Fracture (all sites)	3.49	3.29	3.69
Bacterial pneumonia	3.43	2.11***	3.02
Procedures per admission due to[d]			
Acute myocardial infarction	0.21	0.36***	0.22
Normal delivery	1.17	1.13	0.98***
Fracture (all sites)	1.09	1.27**	1.04*
Bacterial pneumonia	0.19	0.34***	0.18

[a]Mean value of other community hospitals, adjusted for size, location and urban-rural status. See text. [b]Statistics apply only to hospitals reporting a separate long-term care unit. [c]Standardized to reflect similar behavior in an idealized 200-bed hospital. See text. [d]Results based upon HCUP data, 1970 to 1977. The control group statistics are adjusted for size, location, urban-rural status and year. See footnote 7. *Indicates a statistically significant difference at the .05 level, testing the difference between the means of sole community and other hospitals, using a two-tailed test. **Indicates a statistically significant difference at the .01 level. ***Indicates a statistically significant difference at the .001 level.

Source: National Center for Health Services Research and Health Care Technology Assessment. Hospital Studies Program. Based on data provided by the American Hospital Association and the Health Care Financing Administration.

shorter stays are at least partially due to differences in the types of cases they treat. Although Medicare patients also have shorter stays, this difference depends upon size and location. Interestingly, lengths of stay for Medicaid patients are longer in sole community hospi-

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tals. This is probably because Medicaid patients are disproportionately admitted to the long-term care units in sole community hospitals.

Relative to national averages, SCH hospitals provide more outpatient care and emergency services. Normal deliveries and bacterial pneumonia account for more of their admissions. However, these differences disappear when the data are controlled for size and location. Sole community hospitals also perform fewer procedures per admission for specific diagnoses than national averages, although their rates are higher than those of the adjusted control group. Overall, the ratio of surgical procedures to short-term admissions is smaller in institutions with SCH status. While sole community hospitals seem to provide a more service-intensive product than their peers, controlling for diagnosis, lower overall surgical rates for these hospitals suggest that admissions to SCHs disproportionately involve medical diagnoses with low procedure rates.

Perhaps the two most important findings in Table 3 pertain to the occupancy rate of sole community hospitals and the portion of their case load attributable to Medicare. Higher occupancy rates imply that the fixed costs of a hospital are distributed over more patients. Hospitals with high occupancy rates have lower average costs, assuming all other factors are the same. Medicare admissions, as a percent of a hospital's total, reflect the vulnerability of an institution to Medicare reimbursement policy because a larger percentage means a hospital is more dependent upon Medicare as a source of revenue. In the case of sole community hospitals, both of these variables are smaller than for other hospitals. Each admission to a sole community hospital must bear a larger portion of the hospital's overhead than in other facilities, on average. Sole community hospitals should have more difficulty covering their costs under a reimbursement system like PPS that pays them a fixed amount per admission based on national norms. However, hospitals with SCH status are less vulnerable to Medicare reimbursement policy. In relative terms, they have more admissions over which to spread whatever shortfalls they sustain from treating Medicare patients.

Sole community hospitals have lower occupancy rates, both in gross terms and after standardizing for differences in hospital size.[8] Table 3 supports the hypothesis that sole community hospitals maintain more excess capacity than other hospitals, even after adjusting for their size, to protect both themselves and their patients against the possibility of the need for their beds exceeding the existing supply at any point in time. This effect is most evident with regard to the standardized occupancy rate for short-term beds.

Availability of facilities and services. According to Table 4, sole community hospitals maintain fewer ancillary services and separate units than other hospitals. However, once size and location are taken into account, sole community hospitals are more likely than comparable hospitals to maintain a particular resource when the two groups differ significantly.

[8] The standardized occupancy rate is an effort to deal with the fact that smaller hospitals must maintain lower absolute occupancy rates if they are to have an amount of excess capacity comparable to larger facilities.

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Table 4. Percent of hospitals reporting medical and surgical facilities and services by sole community hospital status (1982).

	Sole community hospitals	Other community hospitals	Adjusted control group[a]
Hospital units			
Medical and surgical (acute)	100	100	100
Pediatric (acute)	94	85***	89*
Obstetrics	96	79***	88***
Newborn nursery	96	80***	87***
Any intensive care	80	87**	75*
Emergency department	100	96***	96**
Organized outpatient department	24	41***	30
Skilled nursing, long-term care	26	13***	20*
Swing beds	5	1**	2***
Therapeutic services			
Postoperative recovery room	76	92***	80
Respiratory therapy	82	93***	86
Physical therapy	76	89***	77
Ambulatory surgery	77	88***	82
Blood bank	65	74**	59
IV admixture	54	78***	57
Pharmacy with unit dosage	55	77***	59
Dentistry	31	47***	29
Diagnostic services			
Electrocardiography	92	96*	93
Ultrasound	58	75***	50**
Diagnostic radioisotope	38	67***	41
Histopathology laboratory	43	68***	40
Other ancillary services			
Social work	51	78***	51
Hospital auxiliary	85	84	81
Volunteer services	40	67***	43
Patient representative service	34	47***	30
Chaplaincy services	33	55***	37

[a]Mean value of other community hospitals, adjusted for size, location and urban-rural status. See text. *Indicates a statistically significant difference at the .05 level in testing the hypothesis of no difference between the means of sole community and other hospitals, using a two-tailed test. **Indicates a statistically significant difference at the .01 level, using a two-tailed test. ***Indicates a statistically significant difference at the .001 level, using a two-tailed test. Note: services are reported here only if available in at least 50 percent of SCHs or if associated with significant differences.

Source: National Center for Health Services Research and Health Care Technology Assessment, Hospital Studies Program. Based on data provided by the American Hospital Association and the Health Care Financing Administration.

These differences primarily reflect the way in which beds are used and not the availability of specific ancillary services. Ninety-four percent of sole community hospitals have acute pediatric units, 96 percent have obstetrical units and newborn nurseries. All maintain some type of emergency room. Sole community hospitals are more likely to have separate skilled nursing or long-term care units than other hospitals and 5 percent utilize swing beds. While this last figure is not large, it is nearly five times the national average.

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Table 5. Medical staff characteristics by sole community hospital status (1982).

	Sole community hospitals	Other community hospitals	Adjusted control group[a]
Total M.D.s with active or associate privileges	18.6	101.6***	29.6***
Total board-certified M.D.s with active or associate privileges	11.3	68.3***	19.2***
Percent of total M.D.s by specialty			
General or family practice	44.0	30.2***	43.4
Pediatrics	2.6	4.4***	2.6
Internal medicine	7.1	10.2***	6.7
Other medical specialties	3.0	6.4***	3.7
General surgery	9.1	9.3	8.4
Obstetrics and gynecology	2.6	5.1***	3.0
Other surgical specialties	5.2	12.4***	7.0***
Pathology	2.7	3.4*	3.6*
Radiology	4.8	5.1	5.3
Anesthesiology	1.9	2.7*	2.0
Other specialties	2.1	4.1***	2.0
Dental specialties	14.8	6.7***	12.1*
Percent of M.D.s with board certification, by specialty[b]			
General or family practice	40.6	42.8	38.8
Pediatrics	67.4	68.1	63.9
Internal medicine	60.7	62.7	60.0
Other medical specialties	51.0	68.1**	62.5
General surgery	60.5	69.8**	65.2
Obstetrics and gynecology	63.3	67.1	62.3
Other surgical specialties	70.4	73.6	71.2
Pathology	78.0	85.4	83.9
Radiology	76.5	81.9	76.3
Anesthesiology	52.4	54.6	53.2
Other specialties	40.1	49.5	42.9
Dental specialties	56.7	50.8	50.4
Percent of all M.D.s with board certification	53.7	60.0***	56.3

[a]Mean value in other community hospitals, adjusted for size, location and urban-rural status. See text. [b]Hospitals with at least one physician in the indicated specialty. *Indicates a statistically significant difference at the .05 level in testing the difference between the means of sole community and other hospitals, using a two-tailed test. **Indicates a significant difference at the .01 level. ***Indicates a statistically significant difference at the .001 level.

Source: National Center for Health Services Research and Health Care Technology Assessment, Hospital Studies Program. Based on data provided by the American Hospital Association and the Health Care Financing Administration.

Ultrasound is the only ancillary service for which there is a significant difference between SCH-designated hospitals and the adjusted control group, reflecting the wider availability of obstetrical and neonatal services in sole community hospitals. Finally, 80 percent of sole community hospitals maintain some type of intensive care unit. This is smaller than the national average of 87 percent but significantly greater than for comparable hospitals.

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Medical staff characteristics. Table 5 summarizes the characteristics of the medical staffs in sole community hospitals. Their staffs are small, even controlling for the size and location of these hospitals. Fewer members of SCH medical staffs are board-certified than in other community hospitals. However, according to Table 5, this is primarily attributable to the distribution of physicians across medical specialties. Relative to community hospitals in general, sole community hospitals have more physicians in family or general practice and fewer in more narrowly defined specialties. This pattern reflects size and location since there is virtually no difference between the adjusted control group and SCH institutions in terms of board certification.

The figures presented in Table 5 need to be interpreted with caution. Such data generally overstate the effective size of medical staffs because many physicians hold admitting privileges at more than one hospital. Sole community hospitals tend to be isolated, which means that the doctors on their staffs are more likely to have privileges at a single institution. Consequently, they should have fewer staff members per bed than other institutions and the data support this contention. Using Table 5 in conjunction with Table 1 leads to the conclusion that sole community hospitals have approximately half the number of physicians per bed as the national average.

The specialty distribution of physicians parallels the distribution of beds in sole community hospitals. General and family practice, internal medicine, general surgery, and dentistry together account for 75 percent of their doctors. In other hospitals, the total is only 56 percent. Thus, sole community hospitals are less specialized in terms of both their facilities and their medical staffs. An interesting question, but one beyond the scope of this analysis, is how these factors affect diagnosis-specific treatments and costs across types of hospitals.

Employment, compensation and expenses. Theoretically, average costs in sole community hospitals could be higher or lower than the national average. They maintain relatively large amounts of excess capacity and appear to offer a wider range of facilities than their peers. Both tend to raise average costs. However, the diagnostic mix of their patients indicates they should have lower costs because they have shorter lengths of stay and perform fewer procedures per admission than other hospitals. These effects apparently offset each other because the costs per admission in sole community hospitals are virtually the same as in comparable institutions and significantly less than national averages according to Table 6.

Savings are partly the result of lower labor expenses. For short-term units, sole community hospitals employ an average of 2.65 full-time equivalent employees while the national average is approximately 2.95. There are no significant differences in compensation, the sum of salary and fringe benefits, per employee across types of hospitals. Personnel expenses are less almost entirely because of lower staffing levels, not lower salaries.

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Table 6. Expenses, employment, and compensation of community hospitals by sole community hospital status (1992).

	Sole community hospitals	Other community hospitals	Adjusted control group[a]
Expenses (dollars)			
Per admission (all beds)	2,259	2,460***	2,170
Per adjusted admission	1,841	2,127***	1,805
In short-term unit per adjusted admission	1,673	2,057***	1,678
In long-term unit per long-term admission[b]	32,535	31,077	36,355
Employment			
Number of FTE employees per bed			
All hospital units	2.37	2.82***	2.46
Short-term unit only	2.65	2.95***	2.71
Long-term unit only[b]	0.70	0.73	0.70
Total employee compensation[c] (dollars)			
Per adjusted admission (all units)	1,028	1,193***	994
Per adjusted admission (short-term unit)	936	1,152***	927
Per admission (long-term unit)[b]	16,623	14,364	16,507
Per FTE employee			
All hospital units	15,739	16,071	15,168*
Short-term unit only	15,716	16,101	15,257
Long-term unit only[b]	20,894	15,611*	15,620**
Relative labor expenses			
Percent of costs due to compensation			
All units	55.91	55.97	55.75
Short-term unit only	56.28	56.23	56.23
Long-term unit only[b]	54.79	51.77	50.54

[a]Mean value in other community hospitals, adjusted for size, location and urban-rural status. See text. [b]Statistics apply only to hospitals reporting a separate long-term care unit. [c]Compensation defined as sum of payroll and fringe benefit expenditures. *Indicates a statistically significant difference at the .05 level in testing the hypothesis of no difference between the means of sole community and other hospitals, using a two-tailed test. **Indicates a statistically significant difference at the .01 level. ***Indicates a statistically significant difference at the .001 level, using a two-tailed test.

Source: National Center for Health Services Research and Health Care Technology Assessment, Hospital Studies Program. Based on data provided by the American Hospital Association and the Health Care Financing Administration.

Costs also are lower in sole community hospitals because of savings in expense categories other than personnel, *e.g.* interest, depreciation, supplies and inventories. There are virtually no differences, either statistical or substantive, in the percent of total costs attributable to labor expenses across the types of hospitals considered here.

Financial characteristics and profitability. Table 7 summarizes the financial performance of sole community hospitals.[7] Although more detailed data will be necessary to explore this issue completely, the results raise a number of questions about the financial health of sole community hospitals and their capacity to withstand substantial restrictions on their revenues. On average, the charges of sole

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Table 7. Financial characteristics of hospitals by sole community hospital status, in percents (1970 to 1977).

	Sole community hospitals	Other community hospitals	Adjusted control group[a]
Revenue			
Inpatient services	85.9	90.1***	89.4***
Routine services	43.3	46.0*	43.6
Difference between charges and revenues	5.5	9.6***	7.8**
Net surplus from operations			
Charges over total expenses	0.2	9.7***	6.6***
Patient revenue over total expenses	−6.0	−1.9***	−2.2**
Revenue over total expenses	0.9	2.4	2.0
Other			
Depreciation as percent of gross plant and equipment	32.4	30.2	29.9
Long-term debt to total assets[b]	13.0	18.2*	21.6**

[a]Mean value in other community hospitals, adjusted for size, location and urban-rural status and year. See text. [b]Based only on 1974 to 1977 data. *Indicates a statistically significant difference at the .05 level in testing the hypothesis of no difference between the means of sole community and other hospitals, using a two-tailed test. **Indicates a statistically significant difference at the .01 level. ***Indicates a statistically significant difference at the .001 level, using a two-tailed test.

Source: National Center for Health Services Research and Health Care Technology Assessment, Hospital Studies Program. Based on data provided by the American Hospital Association and the Health Care Financing Administration.

community hospitals are set only 0.2 percent above costs and patient care revenues cover only 94 percent of total expenses. These are both significantly below the national averages of 9.7 and 98 percent, respectively. Consequently, sole community hospitals have an average profit margin of less than 1 percent, compared to an estimated 2.4 percent for other hospitals. This last difference is not statistically significant but its magnitude suggests that further analysis is warranted.

Depreciation as a percent of gross plant and equipment, a measure of the age of a hospital's physical plant, is another difference that is potentially important but not statistically meaningful. The fact that SCH-designated hospitals have the largest mean value suggests that their plants may need to be modernized or replaced. To the extent that limitations on hospital reimbursement reduce profit margins, it would be difficult for hospitals to undertake such capital expenditures.

The debt-asset ratio of sole community hospitals is another potentially significant warning signal. This ratio is smaller than for either of the benchmark groups and significantly less than for comparable hospitals. Ordinarily, low debt-asset ratios are a positive sign because they indicate an absence of sizable long-term financial commitments. However, their implications for sole community hospitals are not clear. In view of the low profit margins in these institutions, it is possible they have less debt because it is difficult for them to gain access to financial markets. Further investigation is clearly warranted.

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Table 8. Demographic characteristics of counties with and without sole community hospitals (1980 data unless specified otherwise).

	Sole community hospitals	Other community hospitals	Adjusted control group*
Census population	38,744	89,823***	71,106
Population per square mile	20.91	235.40***	72.99
Percent of population older than 65	12.01	13.33***	13.03***
Percent white population	90.56	88.29*	90.93
Percent of families below poverty level, 1979	15.19	15.31	14.19*
Unemployment rate, 1979 (percent)	9.31	7.86	8.23
Median educational attainment (years)	11.85	11.59***	11.90
Median family income, 1979 (dollars)	16,874	17,010	17,061
Percent of families with female head	6.90	8.29***	7.07
Average age of population	32.24	34.17***	33.91**
Patient care M.D.s per 1,000 population, 1981	0.85	0.87	0.84
Short-term beds per 1,000 population, 1982	5.92	5.22**	5.23*

*Mean value in counties without sole community hospitals, adjusted for regional location and urban-rural status. See text. *Indicates a statistically significant difference at the .05 level in testing the hypothesis of no difference between the means of sole community and other hospitals, using a two-tailed test. **Indicates a statistically significant difference at the .01 level, using a two-tailed test. ***Indicates a statistically significant difference at the .001 level, using a two-tailed test.

Source: National Center for Health Services Research and Health Care Technology Assessment, Hospital Studies Program. Based on the 1984 Area Resource File, Bureau of Health Professions, Health Resources and Services Administration, and data provided by the Health Care Financing Administration.

County characteristics. The counties served by sole community hospitals differ from national norms, as might be expected by their regional distribution and largely rural nature. According to Table 8, such counties have substantially smaller populations and lower population densities; their populations are younger and predominantly white; and there are no significant differences in the median family income. Educational attainment is slightly greater than the national average in counties with SCHs, while the percent of families headed by a female is significantly less.

Both the physician-population and short-term beds per capita ratios measure the availability of health care resources. There are no significant differences in the availability of physicians across counties differentiated by the presence or absence of a sole community hospital. Counties with sole community hospitals tend to have more hospital beds per capita than other counties. Although these ratios are clearly crude measures of resource availability, they suggest that these counties are probably not medically underserved in the usual sense. Delivering needed services to a population that is scattered across a wide area is a difficult problem, but there are substantial medical resources present in areas with sole community hospitals.

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Table 9. Morbidity, mortality and natality rates of counties with and without sole community hospitals (1960 data unless indicated otherwise).

	Sole community hospitals	Other community hospitals	Adjusted control group*
Morbidity			
Cases per 100,000 population			
Chicken pox	23.47	76.20***	8.76
Hepatitis A	6.59	11.49*	17.27**
Measles	3.91	5.16	1.41
Mumps	1.03	3.29***	1.09
Salmonellosis	5.26	13.32***	8.94
Shigellosis	7.50	7.22	11.58
Mortality			
Deaths per 100,000 population			
Infective/parasitic diseases	5.73	6.67	5.82
Malignant neoplasms	166.3	185.7***	175.5*
Ischemic heart disease	228.5	279.4***	257.7***
Other cardiovascular causes	183.1	215.6***	198.4*
Influenza and pneumonia	23.14	24.11	24.60
Bronchitis, emphysema and asthma	26.23	25.14	27.59
Cirrhosis of liver	11.87	9.68*	10.42*
Motor vehicle accidents	39.88	31.12***	36.28*
All deaths	869.2	952.7***	910.0*
Natality			
Total births	688	1,376***	1,183
Total fertile females (age 15-45)	8,807	21,005***	16,746
Fertile females as percent of population	21.52	21.60	21.36
Births per 100 fertile females	8.55	7.41***	8.12***
Infant mortality rate (deaths per 1,000 live births, 1974-78)	14.7	15.6*	14.5

*Mean value in counties without sole community hospitals, adjusted for regional location and urban-rural status. See text. *Indicates a statistically significant difference at the .05 level in testing the hypothesis of no difference between the means of sole community and other hospitals, using a two-tailed test. **Indicates a statistically significant difference at the .01 level. ***Indicates a statistically significant difference at the .001 level, using a two-tailed test.

Source: National Center for Health Services Research and Health Care Technology Assessment, Hospital Studies Program. Based on the 1984 Area Resource File, Bureau of Health Professions, Health Resources and Services Administration, and data provided by the Health Care Financing Administration.

Table 9 summarizes the morbidity, mortality, and natality experience of counties with sole community hospitals. In general, the population of these areas is somewhat healthier than average, even in comparison to similarly located areas. Morbidity rates are lower than the national average for four of the six disease categories indicated in this table. Counties with sole community hospitals also have lower mortality rates in general and lower rates specifically for malignant neoplasm, ischemic heart disease, and other cardiovascular causes. Their rates are higher only for cirrhosis of the liver and motor vehicle accidents among the categories considered here.

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Table 10. Distribution of hospitals by distance to nearest neighbor.

Distance (miles)	Number of Hospitals	Number with SCH status	SCHs as percent of hospitals	SCHs as percent of all SCHs
50 +	10	8	80.0	5.8
25-50	147	55	37.4	40.1
15-25	668	48	7.2	35.0
10-15	526	8	1.5	5.8
5-10	374	7	1.9	5.1
0-5	1,674	11	0.7	8.0
Total	3,399	137	4.0	100

Source: National Center for Health Services Research and Health Care Technology Assessment. Hospital Studies Program. See text for data sources.

Another dimension along which counties with sole community hospitals are clearly different from other localities is fertility. Although there are no significant differences across groups of counties in terms of the percent of females of childbearing age according to Table 9, counties with SCH-designated providers have substantially higher birth rates. They also have lower infant mortality rates than the national average, but this appears to be related primarily to their location.

These results are consistent with the county profiles described in Table 8. The population of the areas in question are younger and better educated. This should translate into lower crude mortality rates, lower rates of illness and disease-related mortality, higher birthrates, and higher rates of death from accidents and other unnatural causes. Table 9 seems to confirm this pattern.

There is a parallel between the facilities available in sole community hospitals and the medical needs of their target populations. In particular, all sole community hospitals have emergency departments and relatively more of them have separate pediatric, obstetric, and neonatal units. Sole community hospitals also seem to have a less severely ill set of patients and shorter lengths of stay. These seem to reflect the underlying healthiness of the populations they serve, the apparent age of their patients and the comparatively high birth rates in these areas.

The Pattern of SCH Designations

The data suggest that sole community hospitals resemble other similarly sized and located hospitals far more than they differ. The disparities between sole community hospitals and other comparable institutions appear to be matters of degree. This raises a classic question of equity, whether similarly placed hospitals are being treated in an even-handed manner and whether the special treatment accorded to sole community hospitals can be justified by the size of the differences observed in the data. However, the treatment of sole community hospitals will differ from that of otherwise similar facilities for two reasons. One is Medicare reimbursement policy

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and its special SCH provisions. The other is the extent to which hospitals that could qualify for SCH status fail to apply for and receive the SCH designation.

The burden of acquiring sole community hospital status rests primarily on the hospitals themselves. As a result, an institution is more likely to be designated as an SCH if it is well managed and experienced in dealing with public regulatory authorities. Casual inspection of the distribution of sole community hospitals suggests that there are substantial differences across regions in the rates at which eligible hospitals are receiving SCH designations. A significant number of hospitals that appear to meet the standards set by HCFA for SCH status were not designated as sole community hospitals as of November 29, 1982.

The extent to which eligible hospitals acquire sole community hospital status can be examined more formally. Professor Harold Luft of the University of California, San Francisco, provided the Hospital Studies Program of the National Center for Health Services Research and Health Care Technology Assessment with a list of 3,841 hospitals and the distance of these facilities from their nearest neighbors.[9] These distances understate the true separation of hospitals because they are based upon cartographic coordinates and not actual travel routes. In addition, the neighbors are defined quite broadly. They include many Federal institutions, long-term care facilities and specialized hospitals. Consequently, the distances indicated below are conservative. In every case, patients probably face significantly longer travels in going from an indicated hospital to the nearest, similar community hospital.

Of the 3,841 hospitals, 3,399 were identifiable as non-Federal, short-term general facilities. Of these, 137 were designated as sole community hospitals. Table 10 summarizes the distribution of these hospitals by estimated distance to the nearest neighbor.

Hospitals more than 50 miles from their nearest neighbor unambiguously qualify as sole community hospitals under existing regulations as long as they are located outside of a metropolitan area. According to Table 10, however, only 8 of the 10 hospitals that meet this criterion have received SCH designations. Hospitals between 25 and 50 miles from the nearest neighbor are more problematic, but most of them are also likely to meet the regulatory definition. Only 37.4 percent of these hospitals have SCH status. In contrast, a number of hospitals have attained SCH status even though they are within a reasonable distance of a neighboring institution. In some cases, these neighbors are not similar enough to disqualify the institutions in question. In other cases, these hospitals may meet other tests provided in the regulations. However, it appears that several hospitals have received SCH status even though they do not qualify under the regulations promulgated under Public Law 98-21.

The extent to which seemingly eligible hospitals have obtained SCH designations varies across region and state. Table 11 illustrates this phenomenon. It defines potential sole community hospitals as facilities that are at least 25 miles from a neighbor and reports the

[9] These 3,841 hospitals are a subset of all hospitals in the United States, selected because of their participation in a series of surveys. The calculation of neighbors is not based upon this subset but upon the entire universe of hospitals as identified by the AHA annual survey.

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Table 11. Distribution of potential sole community hospitals by region and state (hospitals at least 25 miles from nearest neighbor).

State	Number of potential SCH hospitals	Number of designated SCH hospitals
Michigan	5	2
No. Dakota	8	1
Kansas	7	0
Texas	15	1
Montana	13	6
Idaho	5	1
Wyoming	12	6
Colorado	12	8
New Mexico	6	4
Arizona	11	5
Utah	5	5
California	10	8
Region		
Northeast	7	4
North Central	35	7
South	34	3
West	81	49

Note: States with less than 5 potential SCHs are omitted.
Source: National Center for Health Services Research and Health Care Technology Assessment. Hospital Studies Program.

number of both potential and actual hospitals with SCH status by region and state. Only states with at least five potential sole community hospitals are reported individually.

These data provide an additional explanation for the regional distribution of sole community hospitals described in Table 1. *A priori*, one would expect more sole community hospitals in the West because of population density and geography. These findings suggest that western hospitals also are more likely to apply for and receive such status. More than 60 percent of the seemingly eligible institutions in this region are designated as sole community hospitals, whereas less than 10 percent of such hospitals in the South have SCH status. The numbers for the Northeast are favorable but there are very few eligible hospitals. Hospitals in the North Central region either do not apply for SCH status or have little success in the application process.

There are several ways to interpret these data. The relatively large percent of hospitals that appear to be eligible for SCH status, but are not designated as such, may indicate that the regulatory and legislative concern for these hospitals is misplaced. Hospitals may simply not need or desire the special provisions that have been established for sole community hospitals. Alternatively, the rate at which hospitals receive SCH designations may reflect a lack of information: eligible facilities may not apply for SCH status because either they do not know of the opportunity or do not understand the

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value of SCH status. As such, these findings may indicate the extent to which sole community hospital status may expand in the future. They also may reflect the variations in criteria used to approve SCH applications under TEFRA and the need for the kind of standard definition that now exists in the PPS regulations.

Are Sole Community Hospitals Different?

This paper examines the characteristics of sole community hospitals from a number of perspectives. It also attempts to identify factors that make such institutions appropriate candidates for special treatment under Medicare reimbursement policies and evaluates the extent to which eligible hospitals have been accorded SCH status.

Differences between groups of hospitals can usually be found if one looks carefully enough. Therefore, it is not surprising that sole community hospitals are different not only from national averages but also in some respects from hospitals that are otherwise similar in terms of size and location. The appropriate policy questions are not whether these differences exist but whether they are substantial and occur along dimensions that might justify special regulatory treatment. The answer to this question involves judgments about the costs of handling dissimilar institutions within a uniform framework and the benefits of simplifying the administrative and regulatory process for hospitals.

Summary of Results

Sole community hospitals are predominantly small, rural, and western. They are organized almost exclusively on a not-for-profit basis and play virtually no role in medical education. In comparison to national averages, sole community hospitals have fewer specialized services and facilities; fewer board-certified physicians and more physicians in basic medical specialties like family practice, internal medicine and general surgery; lower labor costs; fewer employees per bed; and, generally, lower costs per admission. However, these characteristics are explained by their unusual size and location so that sole community hospitals, when compared to peer hospitals, do not differ with respect to these characteristics.

In contrast, several differences persist even after the data are controlled for size and location. Sole community hospitals have less severe case mixes, treat fewer Medicare patients, have shorter lengths of stay, and operate with lower occupancy rates even adjusting for size. They are more likely to maintain separate units for acute pediatrics, obstetrics, neonatal care, emergency services, and long-term care. Relative to their peers, SCH hospitals are also more likely to have some type of intensive care facility.

The financial position of sole community hospitals appears to be somewhat less favorable than for comparable facilities, although the data are simply not adequate to provide more than informed

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speculation on this issue. They appear to have older facilities, operate on smaller profit margins, and have less access to capital markets. To the extent that further analysis supports this conclusion, it may even indicate a need for more direct remedial measures than the SCH provisions of TEFRA and PPS.

In addition, sole community hospitals appear to have higher costs per admission, controlling for diagnosis. This is implied indirectly with the data used here, but it is consistent with the work of others.[10] Most measures of case mix examined above suggest that sole community hospitals have a less severely ill set of patients but their average costs per admission are similar to comparable hospitals. Consequently, the average cost per admission within diagnoses must be higher. There are substantive reasons to believe this is the case. Sole community hospitals have fewer admissions per bed, even after controlling for size-related differences in occupancy rates. Consequently, they will be forced to allocate their overhead across a smaller set of patients.[11]

Policy Implications

The apparent desire of sole community hospitals to maintain more capacity and a broader range of facilities than their peers parallels one objective of HCFA's SCH regulations: to preserve access to services in the face of possible reductions in Medicare reimbursement. This suggests a change in existing regulations because most costs associated with capacity and service capability are fixed and related to capital acquisition. Differences in the resulting overhead expenses due to sole community hospital status are perhaps better handled through Medicare's treatment of capital expenses rather than through the existing provisions that essentially increase reimbursement for operating costs.

To the extent that the provisions for SCH status under Medicare are directed at hospital capacity and service availability, the data presented in Tables 10 and 11 are particularly noteworthy. There is a large number of hospitals that could qualify for SCH status but have not received such designation. If the objective of granting SCH status is to achieve an explicit goal, rather than to respond to special problems as they develop, some effort should perhaps be made to extend SCH status to all hospitals that qualify and for which such a regulatory program would be beneficial. But, the sole community hospitals identified in this analysis undoubtedly represent an incomplete list in the sense that they all acquired SCH status prior to the implementation of Medicare's Prospective Payment System. The extent to which additional hospitals, if any, seek SCH designations will indicate the value of these regulations to appropriate hospitals and may reduce the concerns raised earlier with regard to their equity.

Ultimately, the rationale for treating sole community hospitals differently under PPS and TEFRA must be based on a combination of

[10] Findings reported by Vaida (1984) seem to confirm this. He reports that western, rural hospitals would be net losers under a national system of rates for Medicare's PPS.

[11] Although the results are not reported here, the variability of financial characteristics, volume and case mix in a small number of SCHs was also compared to national averages. The purpose was to determine if sole community hospitals have greater uncertainty about their operations, even if their means resembled those of otherwise comparable hospitals. This analysis indicated that the variances of operating margins and expens are greater in SCH hospitals but that thes differences could not be explained by fluctuations in case mix, length of stay or admissions.

factors. The most important may be uncertainty about the long-run impact of current Medicare reimbursement policy on the financial position and availability of services in community hospitals in general. Sole community hospitals are different in the sense that their patients cannot respond to reductions in service by acquiring their care elsewhere. Consequently, considerable risk aversion is warranted, and it seems appropriate to minimize the impact of PPS and TEFRA on sole community providers until the full implications of these programs are known.

There is a number of other areas where additional analysis seems to be warranted. The financial position of sole community hospitals needs to be evaluated with more complete and accurate data than are available here. In addition, it would be helpful to compare the revenues that SCH-designated hospitals now receive under TEFRA and PPS with those they would receive without their SCH status. Both revenue streams also could be compared to their actual cost experiences.

Although further research is clearly warranted, final decisions about the future of regulations pertaining to sole community hospitals involve political judgments. These decisions must carefully balance a desire to preserve adequate access to hospital services with the knowledge that such hospitals are primarily distinguished, not by their isolation *per se*, but by their size and location.

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Background note: Legislative and regulatory history of sole community hospitals

[12] Social Security Act, as amended, § 1886(a)(2)(A).

[13] Social Security Act, as amended, § 1886(a)(3).

[14] 42 CFR § 405.460(e)(1)

[15] *Federal Register*, 49(1):270-272, January 3, 1984.

[16] 42 CFR § 405.476(b)(3).

[17] 42 CFR § 405.476(c) and (d).

[18] *Federal Register*, 48(171):39780-39782, September 1, 1983.

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The Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA) imposed a number of restrictions on Medicare reimbursement to hospitals. However, the Congress recognized that such limitations might be inappropriate for certain providers. It incorporated a number of exemptions into this legislation and gave the Health Care Financing Administration (HCFA) considerable discretion in implementing the law. For example, TEFRA specifically exempted rural hospitals operating with less than 50 beds.[12] The statute also required HCFA to take the "special needs of sole community hospitals" into account in formulating its policies for exemptions, exceptions, and adjustments.[13] HCFA subsequently chose to treat these hospitals like small rural hospitals and to exempt them entirely from TEFRA limitations on Medicare reimbursement.

Neither Congress nor HCFA codified a precise definition of sole community hospitals under TEFRA. In its regulations, HCFA defined a sole community hospital to be simply "a hospital which, by reason of factors such as isolated location or absence of other hospitals, is the sole source of such care reasonably available to beneficiaries."[14]

The absence of a clear standard for determining SCH status led to two problems.[15] Because each regional office could develop its own criteria for SCH applications, a hospital that might be designated as a sole community hospital in one area could be denied such status in another. In addition, the regulations did not provide adequate grounds with which to defend the decisions of the regional office on appeal either to the Provider Reimbursement Review Board or the courts.

These problems were addressed with the enactment of the Social Security Amendments of 1983, authorizing a Prospective Payment System for Medicare. Section 1886(d)(5)(C) of this law authorized exceptions and adjustments to PPS for sole community hospitals. Its definition of such facilities was similar to that used by HCFA in its TEFRA regulations. HCFA, in turn, increased the specificity of its regulations. It defined a sole community hospital under PPS as a short-term, acute care facility in a rural (non-MSA) area that:[16]

- is located more than 50 miles from a similar hospital; or
- is located between 25 and 50 miles from similar hospitals and either (1) is isolated from these other hospitals at least one month a year, or (2) exclusively provides services to at least 75 percent of the population in its service area; or
- is located between 15 and 25 miles from similar hospitals but is isolated from these hospitals at least one month a year as a result of topography or weather conditions; or
- was designated as an SCH prior to October 1, 1983.

HCFA allowed hospitals to meet the 75 percent service requirement in the second test, above, on the basis of either the total population or Medicare beneficiaries. It also waived this standard if the hospital could demonstrate it would have met the test had patients not gone elsewhere because specific services were not available in the potential SCH.

Sole community hospitals are treated differently for the purposes of PPS in two respects.[17] Their reimbursement rates are set permanently at 75 percent of the hospital-specific payment rate plus 25 percent of their regional rate. They also are eligible for adjustments in their payments, based upon their actual fixed and variable costs, if they experience more than a 5 percent decrease in discharges from the prior year. To qualify, an SCH must demonstrate that this decrease significantly affected its average cost per discharge and that it was the result of circumstances beyond its control.

Hospitals apply to their fiscal intermediaries for SCH designations and final decisions are made by the HCFA regional offices. The burden of applying for SCH designation and demonstrating eligibility rests entirely upon the hospital. As documented in the text, this has contributed to a situation where only a portion of seemingly eligible facilities have received SCH designations.

The TEFRA exemption for SCHs is clearly beneficial since the only cost to a hospital is the application process. However, SCH status under PPS may lower Medicare reimbursement if the hospital-specific payment rate is less than the regional or national rate available to an institution. HCFA has recognized this possibility and permits hospitals to relinquish their SCH status, although a hospital that exercises this option may not reapply unless all other hospitals within 50 miles close.[18]

Sources of data

This analysis uses several sources of information. HCFA provided a list of 274 hospitals that had applied for and received sole community hospital designation as of November 29, 1982. Consequently, all of the sole community hospitals considered below met criteria employed under TEFRA prior to the promulgation of a standard definition in 42 CFR § 405.476(b)(3) and sought such status independent of whatever incentives are embodied in the DRG-based reimbursement system now used by Medicare. These 274 hospitals were matched with the annual survey of the American Hospital Association for 1982. Successful matches were made in the case of 265 facilities. The AHA data were used for much of the analysis, particularly those questions pertaining to organizational structure, medical staff, and aggregate utilization patterns.

In addition, the Area Resource File, prepared by the Bureau of Health Professions, Health Resources and Services Administration, U.S. DHHS, was used to analyze morbidity, mortality, and the availability of medical resources. Professor Harold Luft of the University of California, San Francisco, also provided definitions of market areas that he has developed based upon geographic proximity.[19] These data were used to evaluate the reasonableness of sole community hospital designations and to assess the number of hospitals that might actually be eligible for SCH status.

Finally, the list of sole community hospitals was matched with the Hospital Cost and Utilization Project (HCUP) data base of the National Center for Health Services Research and Health Care Technology Assessment.[20] This source contains information on nearly 400 short-term, general, non-Federal hospitals in the United States, selected according to scientific sampling procedures for the years 1970 to 1977. Because only 11 sole community hospitals were found in the HCUP sample, this source was used primarily to analyze characteristics for which no other secondary data were readily available: financial information obtained from hospitals' Medicare Cost Reports and tabulations of both patients' clinical status and use of services from hospital discharge abstracts. Although findings based on HCUP data can only be considered indicative, at least two questions can be raised concerning their validity: the small number of sole community hospitals in the HCUP sample (N = 11) and concerns over the representativeness of this sample.

Although there are only 11 SCHs in the HCUP sample, this source provides a time series of potentially 8 years on each observation. This means that there is more information about sole community hospitals in the HCUP data base than would be available in 11 randomly selected hospitals from the AHA survey. In fact, these 11 hospitals provide a total of 87 data points, although admittedly they are not independent observations.

The representativeness of the HCUP data is a more difficult question. By design, this sample is not representative of the universe of community hospitals and serious questions can be raised about the validity of generalizing from HCUP SCHs to all sole community hospitals. The HCUP sample was drawn according to a weighted stratified random selection process in which weights were chosen to maximize the variation in hospitals' characteristics. Consequently, it is well suited for modeling purposes, where large variances within explanatory variables are desirable, but this selection process means that HCUP data may not be directly comparable to the general experience of U.S. community hospitals. In examining effects on a national level, it is important to control for factors that make the HCUP sample different from the universe of hospitals.

Table 12 compares a range of characteristics for sole community hospitals in the HCUP sample and in the SCH universe. It illustrates how the sample design influences observed characteristics. In particular, SCHs in the HCUP sample are more evenly distributed across regions and tend to be somewhat larger than other sole community hospitals. The latter is partially attributable to the fact that the HCUP sample excludes hospitals under 30 beds and, therefore, a significant number of SCHs. However, significant differences exist between SCHs across types of hospitals, even when comparisons are restricted to hospitals with at least 30 beds.

The size and regional characteristics of the HCUP sample are reflected in significant differences involving two other variables: medical school affiliation and numbers of facilities and services.

[19] For a description of the methodology used to develop these definitions, see Luft and Fox (1983).

[20] To preserve the confidentiality of the data from hospitals participating in the HCUP data base, this work was performed by SysteMetrics, Inc., Santa Barbara, California, under contract OASH 233-78-3001.

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Table 12. Comparison of HCUP sample sole community hospitals with all sole community hospitals, 1975.

	HCUP SCHs	All SCHs	SCHs with beds ≥ 30
Region (percent)			
Northeast	0	6[a]	8[a]
South	36	15	17
North Central	27	12	13
Western	36	67	62
Control (percent)			
Public	36	46	46
Voluntary	64	52	53
For-profit	0	2	1
Other characteristics			
Percent with medical school affiliation	18	1[b]	1[b]
Percent in non-SMSA counties	100	94	94
Percent with separate LTC unit	27	18	19
Number of beds (total)	118	57[b]	72[b]
Number of beds (short-term)	105	54[b]	67[b]
Length of stay (overall)	7.2	6.8	7.2
Length of stay (short-term)	5.6	5.2	5.4
Gross occupancy rate (overall)	58	53	56
Gross occupancy rate (short-term)	57	52	55
Standardized occupancy rate (overall)	69	73	72
Standardized occupancy rate (short-term)	68	71	71
Number of facilities and services	13.3	7.3[b]	8.9[b]
Outpatient visits per short-term admission	6.3	5.6	5.4
Operations per short-term admission	.318	.257	.293
Assets per bed (total in dollars)	22,653	36,038	36,898
Expenditures per bed (total in dollars)	29,328	25,093	26,261
FTE employees per bed (total)	2.04	1.83	1.88

[a]The hypothesis that the regional distribution of HCUP SCHs is the same as all SCHs is rejected at the .05 level using a chi-square goodness-of-fit test. [b]The hypothesis that this characteristic of HCUP SCHs is the same as for all SCHs is rejected at the .05 level using a one-sided t-test.

Source: National Center for Health Services Research and Health Care Technology Assessment. Hospital Studies Program. Additional data provided by the American Hospital Association and the Health Care Financing Administration.

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However, there are no other statistically significant differences between HCUP sole community hospitals and the SCH universe among the variables considered here.

Throughout the analysis presented in this report, efforts were made to control for size and location. Hospitals were stratified according to region, urban-rural status, and number of beds. The four regional categories indicated in Table 12 were used along with five size classes: 0-49, 50-99, 100-199, 200-299, and more than 300 beds. This analytical strategy should substantially reduce the impact of the HCUP sample design on the measurement of effects associated with SCH status.

Results based on HCUP data are reported here simply because they were the best available data for this analysis. Readers should bear the issues of sample size and representativeness in mind in interpreting such findings. Judgments about the validity of results derived from this source can only be resolved in the short run by readers' own judgments and in the long run by further research based on data that are greater in number, more representative of the universe, and drawn from more recent periods of time.

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